MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING)
END SEMESTER EXAMINATIONS (ON-LINE), AUGUST 2021
SUBJECT: PYTHON PROGRAMMING [CSE 4309]
REVISED CREDIT SYSTEM
(16/08/2021)

TIME : 2 HOUR   **MAX.MARKS : 40M**

Instructions to the Candidates
- Answer any **FOUR** full Questions.
- Missing data can be suitably assumed

1A. i. "The Python interactive shell attempts to evaluate both expressions and statements". Justify your answer with an example.
ii. Calculate rainfall l in gallons for some number of inches on 1 acre. Write a python program to do the following.
a.Prompt the user for the number of inches that have fallen.
b. Find the volume (in cubic feet) of water (where volume = depth * area).
c. Convert the volume (in cubic feet) to gallons.
Consider the conversion formulas:
1 acre = 43,560 square feet
1 cubic foot = 7.48051945 gallons   5M

1.B. i. What is Slicing? Write the syntax of Slicing and explain with an example.
ii. List and explain the kinds of errors in Python with example.   5M

2.A i. Write a Python non-function program named as 'die.py', that simulates the rolling of a die. Roll the die three times and generate random number in the range 1….6.
ii. Write a Python program named as 'addnonnegatives.py',   that allows a user to enter any number of non-negative integers. When the user enters a negative value, the program no longer accepts input, and it displays the sum of all the non-negative values. If a negative number is the first entry, the sum is zero. (use While loop and do not use built-in function)   5M

2.B. i. Define a function 'printTuple', which can generate and print a tuple where the value are square of numbers between 1 and 20 (both included).
ii. How many characters are there in the string "a\nb\x1f\000d"? A string is a palindrome if it reads the same forward and backward. The words "mom," "dad," and "noon," for instance, are all palindromes. Write a python program to do the following.
a) Define function 'main' that prompts the user to enter a string and reports whether the string is a palindrome or not.
b) Define a function 'isPalindrome', which can check whether the first character in the string is the same as the last character. If so, then the program can check whether the second character is the same as the second-to-last character. This process

continues until a mismatch is found or all the characters in the string are checked, except for the middle character if the string has an odd number of characters.

c) Test the main function. 5M

3.A   i. Assume a file "sample.txt" is available with one word per line. Write a function called createDict() which reads the words from the file "sample.txt" and stores them both as keys and values in a dictionary named as "wordDict" and returns wordDict. Make use of for loop in your function. Also make use of appropriate string handling function in your function.

ii. What are the four different ways in which importing can be done? Give syntax and usage of each one. 5M

3.B   Consider the following matrices :

A= ((1, 2, 3), (4, 5, 6), (7, 8, 10)) and   B = ((7, 8, 10) ,(4, 5, 6), (1, 2, 3))

Write a python program to perform the following using Numeric Python (numpy).

i) Add and Subtract of the Matrix A and B, print the resultant matrix C for add and E for subtract.

ii) Compute the sum of all elements of Matrix A, sum of each column of Matrix B and sum of each row of Matrix C

iii) Product of two matrices A and B, and print the resultant matrix D

iv) Sort the elements of resultant matrix C and print the resultant Matrix E.

v) Transpose the Matrix E and print the result 5M

4.A   i. Consider the contents of quote.txt is as follows.

"You'll never be brave if you don't get hurt.

You'll never learn if you don't make mistakes.

You'll never be successful if you don't encounter failure."

Write a python program to do the following.

a) Create a module linecount and Create a function lc(filename) to count the number of lines in the given filename named as 'quote.txt'.

b) Import linecount and show the usage of lc function

ii. Write the syntax of open function and briefly discuss its parameters with an example. 5M

4.B   i. Define a class Student consisting of instance variables (private) { name, age and gender }, a method { printData() } and constructor to initialize its instance variables using default arguments. Derive a class StudentResult from Student. The class StudentResult consists of an instance variable (private) {grade}, a method { printResult() } and a constructor. Create an instance of StudentResult class and display the student basic information along with result.

ii. The file name as text.txt contains the following.

Python is a widely used high-level, general-purpose, interpreted, dynamic programming language.

Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java.

Python supports multiple programming paradigms, including object-oriented, imperative and functional program. 5M

Write a python function 'longest_word' to count the word and Test the same.

5.A Develop User interface for Simple calculator and consider the UI layout as shown in Fig. 1.
Write a Python Program to perform the following tasks.
i) Write a user defined function 'get_variables(num)', which gets the user input for operands and puts it inside the entry widget when button(0/1/2/3/4/5/6/7/8/9) pressed.
ii) Write a user defined function 'calculate()', which evaluates the expression when button '=' pressed.
iii) Write a user defined function 'clear_all()', which clears all the content in the Entry widget when button 'AC' pressed.
iv) Add the buttons, text box, and show the simple arithmetic operations ('+'/'-'/'*'/ '/') when button '='pressed.
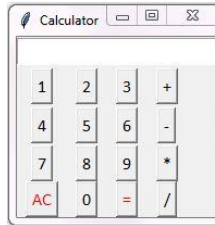
5M

Fig. 1 layout of calculator

5.B Write a python program to create a Student database with STUDENT_INFO as the only table. Table schema is as follows: (Name TEXT, Rank INT). Write a query to populate the table with students information, a query to update any student's data and query to retrieve names of all students whose rank is less than 30.

5M

6.A i. What is a web framework? Mention the reasons why you should choose Python framework over your own?
ii. What is CGI? Briefly discuss the n-tier architecture with neat diagram.
CGI allows an external executable file to respond to an HTTP Request from the browser.

6M

6.B Assume that we wish to maintain a database that contains the flight information of an airline during one particular year. This database maintains information about flights, pilots, and assignments of pilots to flights. Each flight has a unique flight number, a departure city, a destination city, a departure time, and an arrival time. Each pilot has a unique company ID, a name, and an experience. Pilots are assigned to fly certain flights on particular days of the year. The table schema are as follows:

Flight (flight_number, Dept. city, Dest. City, Dept. time, Arrival time)
Pilot(CompanyID, Name, Experience)
Assigned_to(CompanyID, Flight_number, Date)

Create a database 'airline.db' and write a Python program to perform the following tasks using SQLITE.
   i.   Write a query to create the tables (Flight, Pilot, and Assigned_to).
   ii. Write a query to add the suitable data to tables (Flight, Pilot and Assigned_to).
   iii. Write a query to retrieve the data from the tables (Flight, Pilot and Assigned_to).

4M

-ALL THE BEST-